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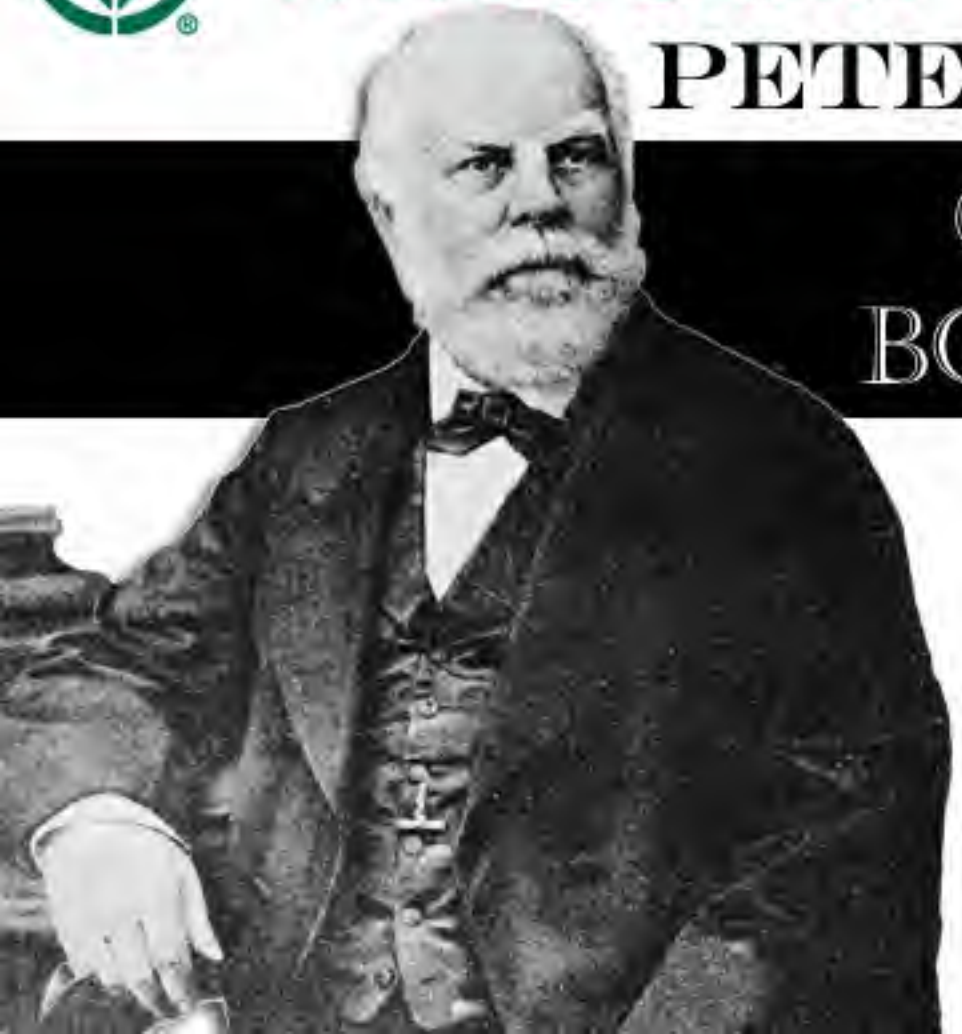

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GEO. ENGELMAN, M. D.
Office & Residence; 3003 Locust St.

P. albicaulis
Brewer: decidedly distinct from
flexilis – very shore alpine,
north of the head of the San Joaquin
South of that point flexilis is found
and replaces in the Southern Sierras
the albicaulis below lat. 37°.
The whole aspect of the two trees is
very unlike – albicaulis is small
and stunted.
Often a low shrub, & short 900 to 11500 feet alt
with red brown cones
Below highest tops of the Sierras
where mountains are lower, above 10,000'
Also on the east side of the Sierras

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MACDONALD & CO.

PER MARE PER TERRAS

PRESCRIPTION DRUGGISTS,

3005 OLIVE STREET

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29 Lemmon Aug 1879

P. albicaulis fringing the forest of Balfourianas and reaching to the snow was the next most interesting pine, of lighter green, with small gray ovate cones. Very prickly erect, however the plant may have been bent down — largest, in the lower region 30 feet — and even as much as 4 feet diameter.

Bark fire furrowed!! Thin

On Scotts Mountain west of Shasta. July 1879

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WOOLSON & COMPANY,

PASSAIC, N. J.,

Dealers in Hardy Plants,

WHOLESALE AND RETAIL.

Passaic, N. J., Aug. 18th, 187

Mr. Wolson

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Pinus (albicaulis flexilis) and Abies Williamsoni up to 10.000 — 11.400 the former
feet altitude
W. Brewer

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Outline sketch of tree Pinus flexilis James near Empire city — C. J.
trunk 1 foot diameter at base 40 ft? high. lower branches
horizontal & recumbent upper branches converging to the axis
foliage rather scant, bunched at the extremity of the branches
J. Torrey 1864

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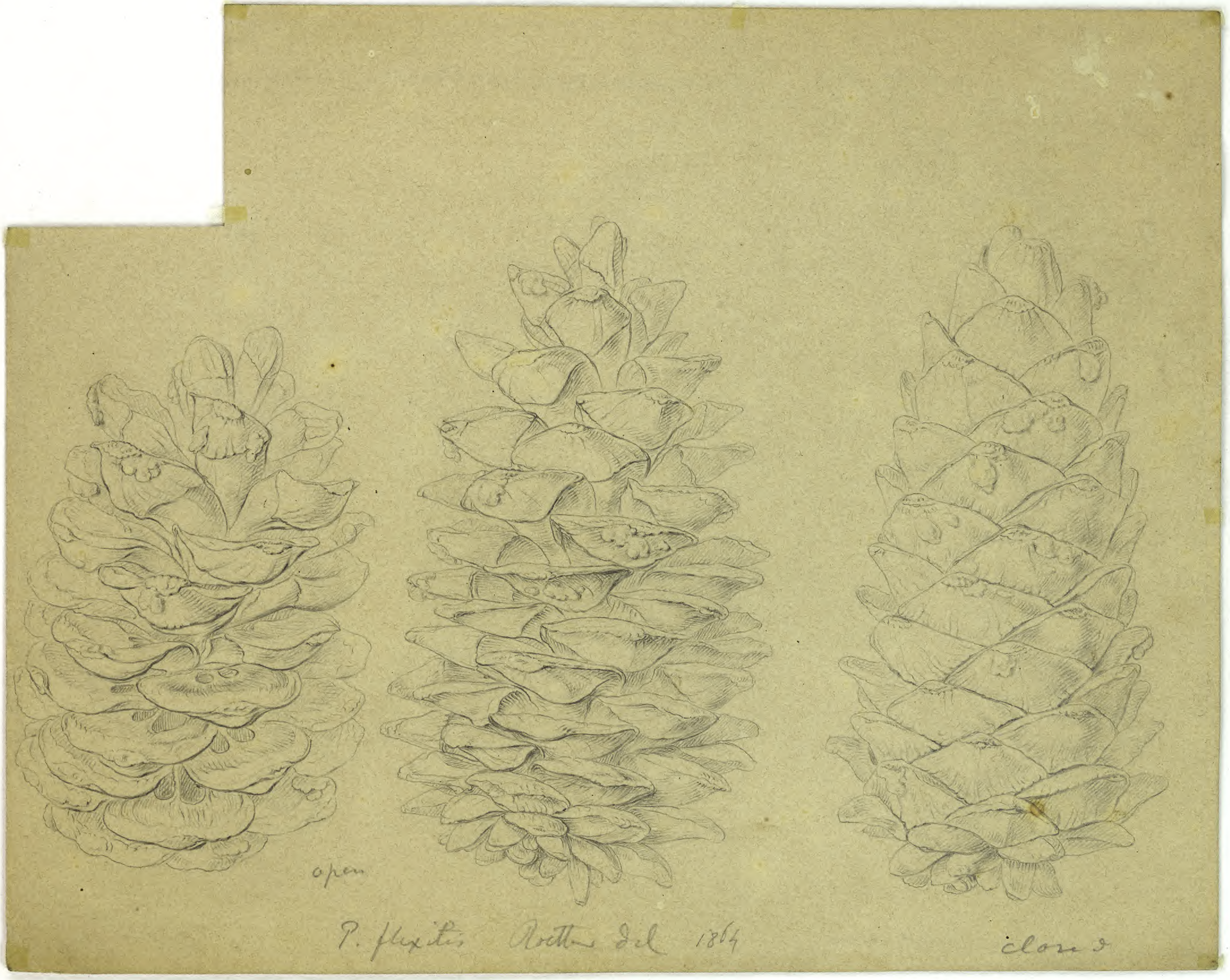

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P. flexilis var. in the Sierra Nevada
South of the head of San Joaquin
and probably across southern
Nevada and Utah to Colorado

Brewer June 1871

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Pinus flexilis
cones short
mountains of South California
(Kings River?)
Dr Vasey mis 1877

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aa Rup 2838.

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P. flexuosus Rothrock No.

Corms 2½ — 7½ inches long
upper side 1 lin to 6 lines
free (in this case occurred
similarly Agaroshanite)

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DR. GEO. ENGELMANN,

Residence, 3003 *Locust Str.*

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Mr Augustus Ed.

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Herb. Illus Audubon Jul 1869.

Rhus flexilis, James "Sur l'Epinette de l'Ouest Nutton."
Prince Max. N. Wied 1833! a fine specimen with young
cones

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H6. Hort Edinbgr Aug 30 1869

No 398 yr.

Pinus flexilis Shasta Valley 5 terminal cones

leaves of sheath remarkably long — 2 loose

Cones

"Pinus 398" printed label, no name —

" cones small nearly round —

Summit of Mountain near Fort Hope,

Fraxers River — 23 Sept 1851 —

both are P. albicaulis — many terminal

cones, on Sept 23 2 Cent long 1½ wide

Cones on edge & keel somewhat obtusely

serrate — transition to Cembra.

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Wm H Brewer – a letter to B Parry March 14 1864

Pinus flexilis truly alpine – every where in California where mountains are high enough to have snow the greater part of the year. Cones oval. No Pines on state sea.

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[better name: var brachycarpa] Hb Kew Sept 6 1869

P. flexilis var albicaulis — East side of Cascade Mts Lat 49, with and above the larch, largest 15' high, elev. 7000' scraggy — not yet in bloom. July 1860 — much the habit of P. aristata. Dr Lyall [is it aristata with same as Dr. spruce?]

P flexilis Bitter Range of Rocky Mts 6500' Aug 1861 — Dr Lyall

" " printed label: 398. Pinus sp. " cones small nearly round — lat 50°, 7000' high — Sept 23' 1851 —

cones verticillate, terminal — flexilis var albicaulis but with longer leaves the usual — No doubt from Jeffrey.

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P. flexilis drops its seeds between
Sept 8 & 14th

P. ponderosa retains leaves 6 or 7 years

~~A. concolor 12 or 13 years~~

Bridgeport Sept 1877

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P. flexilis – Sangre de Christo Pass,
circumference 4 feet above ground 7 feet
height to first large limb. 6 feet
height 50 feet

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ded of the importan
of the Mortuary Sta

Remarks .....

I certify that I attended the person above named, who died of the disease stated, on the date named.

.....*M. D.*

(Address) .....

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Place of Burial Lbbll

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C S Sargent Nov 22 & 11th 1878

Pinus flexilis very common in the California Sierras at 7-8000 alt; much larger and finer than in Nevada

None about Eureka in Nevada, but further south, in the Monitor ?? Mountain range, where it is sawed into fair lumber

It gives the name to the "White Pine Range" in Nevada

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The undersigned recommend to Membership of the American Association for the Advancement of Science,

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D Hayden March 1862

"Pinus flexilis" is abundant on the head of Snake River, bears a nearly 3 cornered nut which is much used by the Pannac Indians and Snake Indians ( ) size & shape of nut, but very variable

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Stage of the River at St Louis in 1861

by George Engelmann M.D.

~~I have on the diagram, plate 4,~~

The Diagram, plate 4, exhibits, besides the quantities of rain

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Torrey & Gray Vol II pg 34. account of P. flexilis

"The leaves are short & rather rigid. The sheaths which surround their bases short, & lacerated. The strobiles erect composed of large unarmed scales being somewhat smaller than those of P. rigida but similar in shape and exuding a great quantity of resin. The branches which are covered with leaves chiefly at the ends are numerous & recurved inclining to form a dense and large top. They are also remarkably flexible feeling in the hand somewhat like those of Dacca pulustris. × × × × The fruit of the P. flexilis is eaten by the Indians and French hunters about the Rocky Mountains"

Gray Dec 1861

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on the Mt slopes of Middle Park &c.
It is here a magnificent tree, with a
very even columnar trunk below and
lofeem upwards into a slender spire.
The bark is scaly smooth brownish red
and quite thin wood remarkably white,
soft, and preferred to the timber of Pinus
ponderosa for inside work being more free
from knots & less resinous. I think I
must have seen it 2½ ft diameter at
base and over 100 ft high. It grows
rapidly as shown by the annual rings.
Very different from A Menziesii as you

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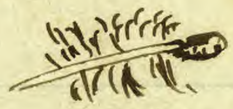
June 18th 1862

Now to solve the mystery of the position of cones on P. flexilis — which is very simple and very instructive. The same rule of position holds good on P. aristata. (though there is often two cones together) The early forming cones are developed at the extremity of last years branch and extend in a line with the branch  as the next season advances a leaf bud shoots out on the upper side of the young cone and as this branch develops the cone is gradually inclined downwards till at the end of the season it is in this position and where the cones remains over to the 2 or 3d season it is inverted still more pointing downwards at an acute angle with the branch but the cones in this species seldom stay on the tree beyond the second season. in Parvistata they are more persistent. So here is the whole mystery solved. where there are two cones the developing branch shoots between & above them leaving them partly pendent on each side

Dwarfed & stunted specimen with cones

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Pinus flexilis Zuccl 832 certainly shows some teeth on leaves HG Rew Sept 7 1869

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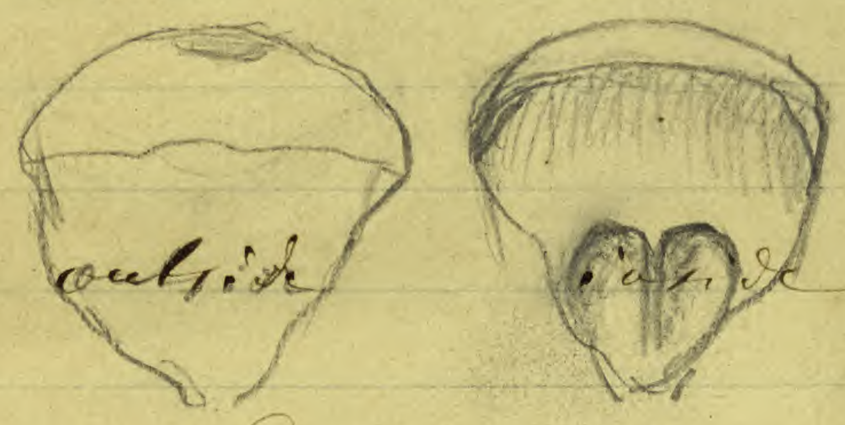
Sept 15 1872

"Pinus monticola" var flexilis macrocarpa

San Francisco Martens, Ferd Bischoff

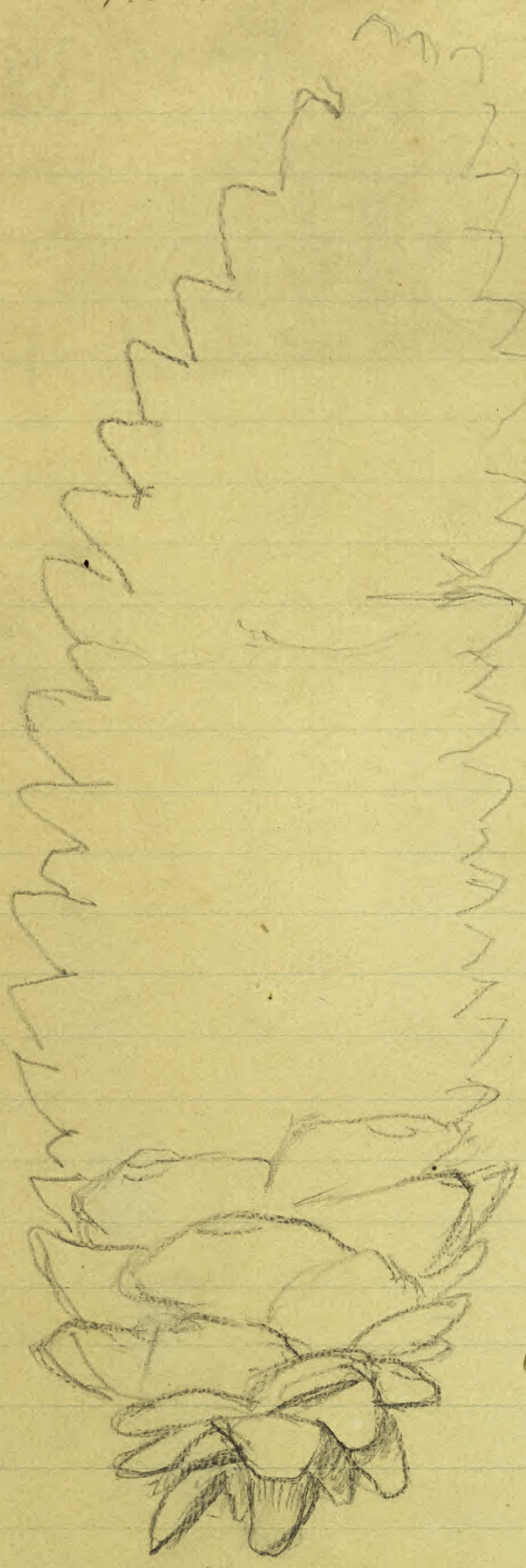
in Lieut Wheeler's Exp. 1871

= 46 Agm



Cone 8 inches long 2½ wide when open. Scales 5/13 longer than 15–16 lines wide ~~apophysis~~ almost as long, ~~apophysis~~ semicircular externally 6 lines long, ~~wide~~ 3 times as long as broad internally 2 lines, open seed cavity 6 lines long, full ½ of the inner closed surface, seed therefore as long or longer than broad wing — probably no wing

apparent size of wing and seed, but questionable whether a wing is formed



The entire leaves and large (probably) wingless seeds prove it to be allied to flexilis or a form of it

A specimen of true P. flexilis of same collection has a cone 6 inches long scales 5/13 12 lines wide, 15–16 long apophysis triangular and mostly spreading or somewhat recurved which is not the case with the rounded scales of the above apophysis same length and width

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3 P. flexilis James in Long's Expd. II. p. 27. & 34
Torr. & Ann. N.Y. Lyc. II. p. 249
Nuttall Sylv. A. pl. 112. III. p. 107

Pinus flexilis & albicaulis

"Cones suspended" Fendler Notes

"Cones inclined to drooping, but less distinctly than in Pinus strobus, frequently a cluster of 3 near the extremity of the branch." Parry 1861

"from the and plains subjacent to the Rocky Mountains, extending up their sides to the region of perpetual frost." James

"sheaths short & caducous, strobile erect, scales large, unarmed etc Torr & Ann. Lyc. II. 249

for James descr. see Parry's letter Dec 19 1861

James brought no specimens

Scattering, never forming forests exclusively; in the lower elevations associated with P. contorta; higher up, approaching the alpine district, scatteringly mixed with P. aristata.

"Cones semipendulous near the end of the horizontal branches, point, downward, 1–3 together" Parry

Fendler N. Mex. 832: "Eastern Mountain range upper region of high Mountains, 60–80 feet high, branches extremely flexible" Cones suspended"

Jun 28 1862: a slow grower; the trunk I examined of less than one foot in diamt had 232 annual rings

July 2d abundant on the slopes of Pikes Peak, while P. aristata is confined to the upper limit of vegetation.

Bigelow in Pacific R. Rep. IV. p. 20: "Pinus flexilis reaches to 12000 feet on the Sandia Mountains, New Mex. and nearly as high on the San Francisco Mtns. In the latter locality the trees were large and beautiful 100–130 feet high. [Confounded with Pinus Lambertiana?]

Torrey – Whipple Rep. p. 141 says that P. flexilis is pretty 40–50 feet high, "It greatly resembles Pinus Cembra"

12004

Parry Oct 1862: My Herbar specimens of P. flexilis were from the lowest elevations, where the cones are smaller and the seeds not well developed. The terminal bud shoots beyond the cones the 2d season and sometimes the 1st. In the latter case the cones try to grow too but fail and fall off. The largest cones I have seen were across the Range, in Middle Park.

Parry Aug 14 1863: Pinus flexilis as low down as Empire city — probably only straggling specimens; it disappears about 1000 feet below the highest line of trees

Parrys numerous specs have leaves 1½ - 2 inches long

only one of Hall's 3 inches

Fendler Santa Fe 2 - 2½ inches

H. Engelm Pole creek on North Platte 1¾ - 2½ or even 3"

Hayden Powder river 1" otherwise 1½ - 2½", Badlands 1½ - 2"

Fremont Fremont on Wind River ? 1½" - 2 from 1st Exp. p. 97

Gunnison on Cochetopec 1½" Pac R.R. II. 2. p. 130

Wood spec. of Parry's smallest annual rings ⅛ lin wide,

largest ½ lin wide, average in a large piece ¼ lin

which would make a tree of 1 foot diameter

¼ X 2 = ½ ½ X 12 X 12 = 288 years old, Parry measures on a trunk less than 1 foot diam 232 rings which is also about ⅓ lines = 0.33"

Dr Lyall Rocky Mtns 49° lat Canada, young stock 2½ - 3"

Male flowers collected by Parry on Pikes Peak July 1st 1862

Germinates invariably with 9 Cotyledons (Parry)

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